

# Plants

Plants can be all sizes, shapes and colours,  
and can live in many different places.  
This book explores the amazing world of plant life,  
from beautiful orchids to the strange,  
meat-eating sundews and Venus's flytrap.

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LEARNERS

# Plants



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Words printed in **bold** are explained  
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# Plants

written by ANITA GANERI

illustrated by JANE PICKERING



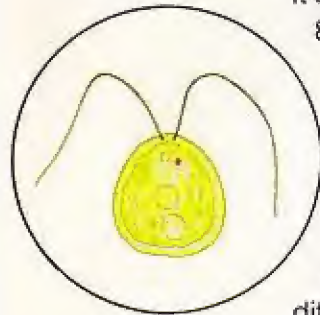
  
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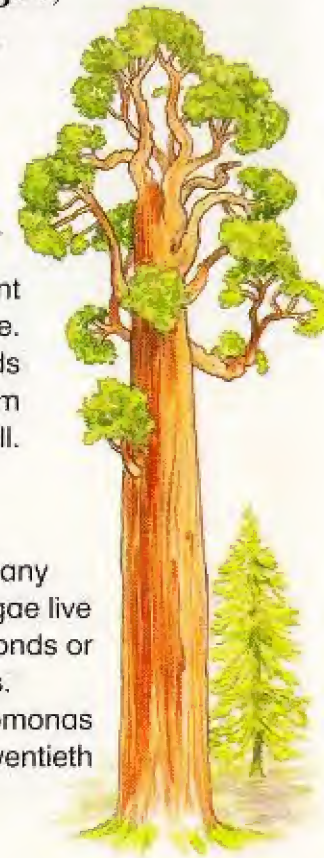
## Plants around us

There are over 375,000 different types of plants in the world. They range in size from the tallest trees to the smallest **algae**, which can only be seen with a microscope.

The largest living plant is a giant sequoia tree. It stands 83.8 m tall.



Many algae live in ponds or ditches. *Chlamydomonas* is less than one-twentieth of a millimetre long.



Plants can grow on land and in the water, in the freezing cold and in scorching heat.

Cacti grow in places where water is scarce. The largest cacti are the saguaros. Their thick stems and branches store water.

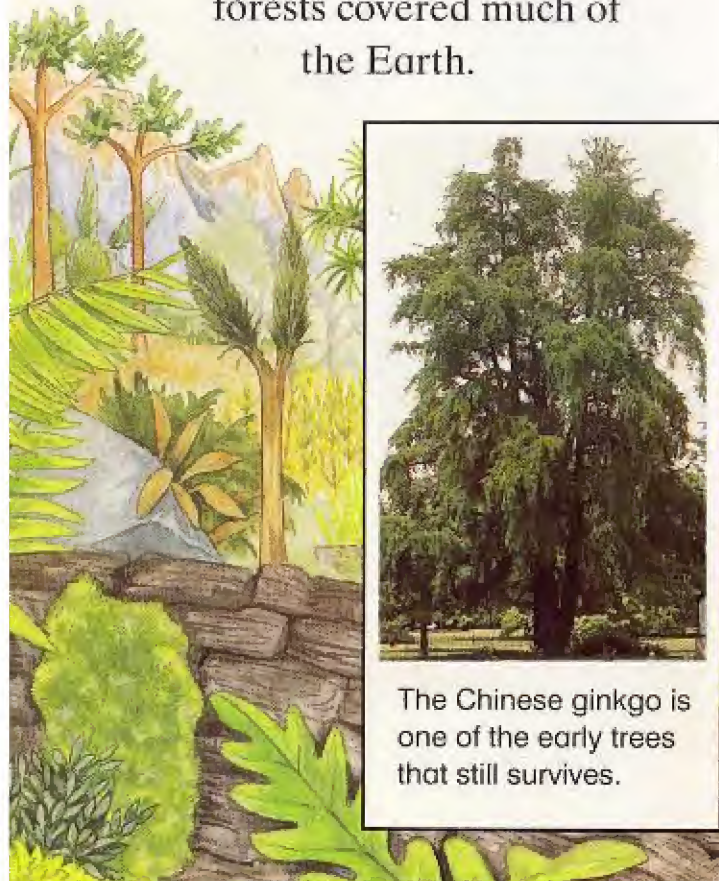


The Alpine poppy grows close to the ground, where it is protected from the bitter wind and cold.



## Prehistoric plants

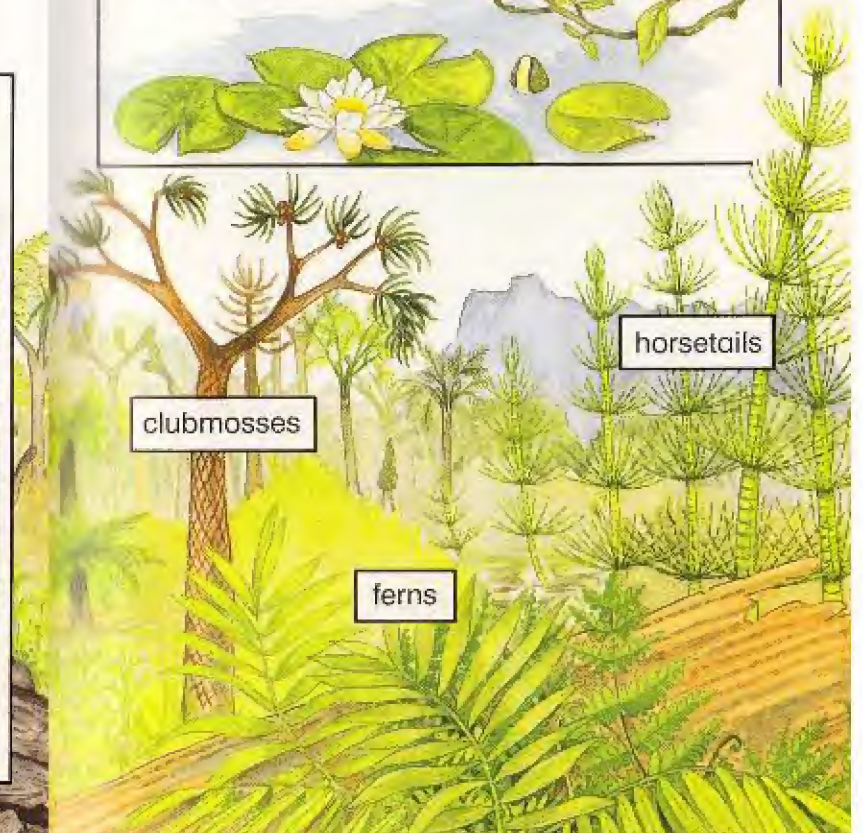
The first plants lived in the sea 3,000 million years ago. By 300 million years ago, plants were growing on land. Thick, steamy forests covered much of the Earth.



The Chinese ginkgo is one of the early trees that still survives.

These early plants were very tall, with strong stems but no flowers.

Magnolias and water lilies were among the first plants to produce flowers 100 million years ago.



clubmosses

ferns

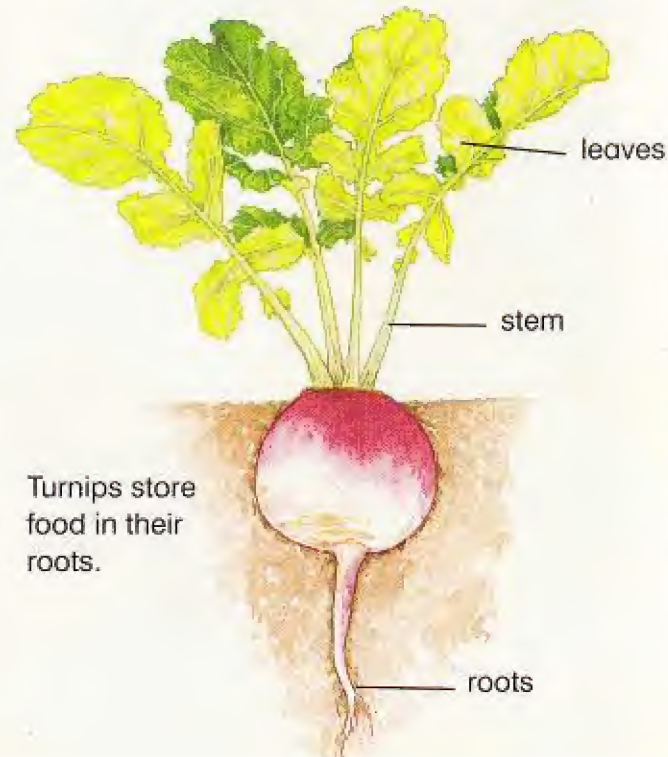
horsetails



## Roots, stems and leaves

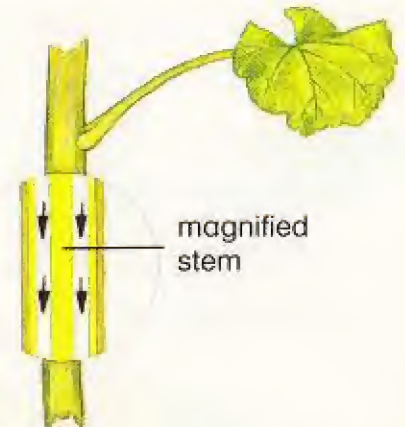
Many plants have roots, stems and leaves.

The roots take up water and minerals from the soil. They also hold the plant firmly in place.

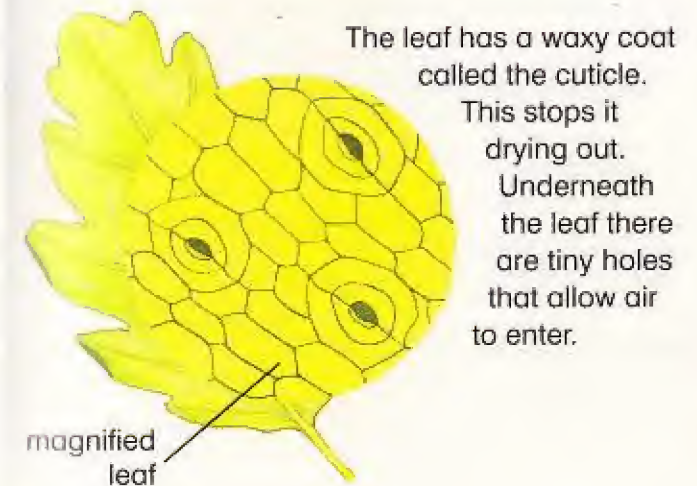


The stems hold the leaves up to the light.

Tubes in the stem carry food from the leaves to the rest of the plant.



Most of the plant's food is made in the leaves.



## How plants make food

Animals need to take in food but green plants can make their own. Their leaves contain a special green substance called **chlorophyll**.

The way plants make food is called **photosynthesis**:

- ① The plant roots take up water and minerals from the soil.
- ② Animals breathe out carbon dioxide, which plants use to make food. The leaves take in carbon dioxide from the air.
- ③ The chlorophyll in the leaves uses sunlight to turn the water, minerals and carbon dioxide into sugary food.
- ④ As they make food, plants give out oxygen, which all other living things need.



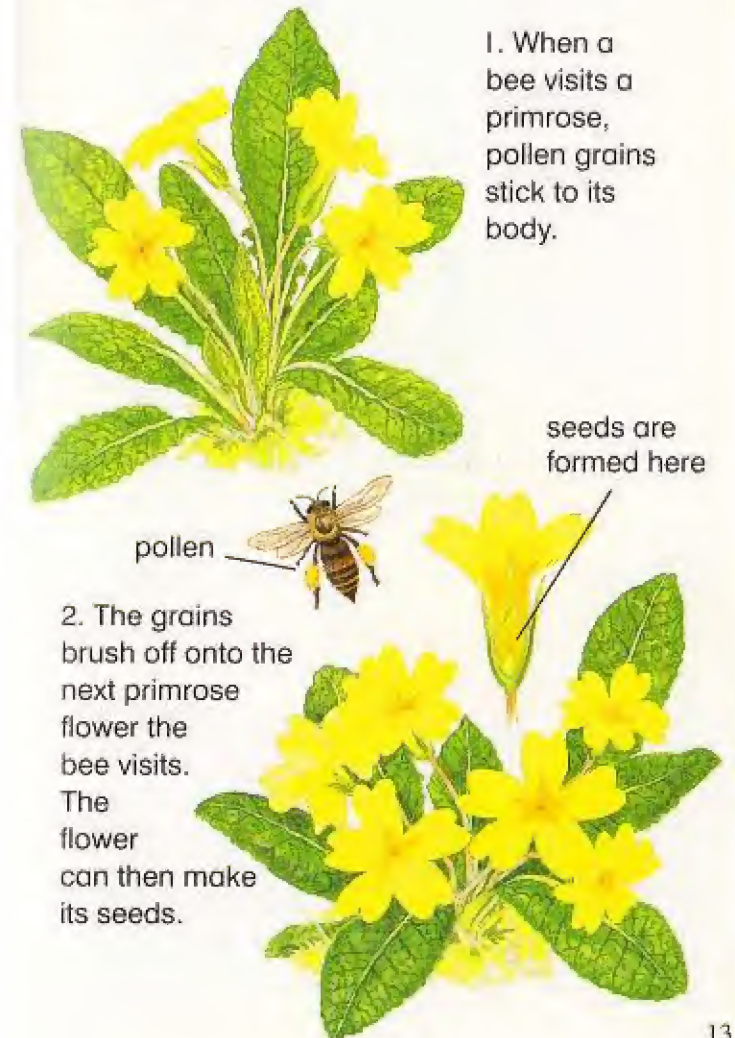


# Flowers

Flowers make seeds that grow into new plants. **Pollen** must be taken from one flower to another for a seed to grow.



Some flowers use animals to carry pollen for them.





## Fantastic flowers

Plants that use animals to carry pollen often attract them with large, brightly coloured petals and strong scents.



Hummingbirds help to pollinate the hibiscus plant. The pollen sticks to their long beaks as they feed on the **nectar**.



The bee orchid looks like a female bee. It has furry flowers and wing-shaped petals. Male bees go to the orchid thinking that it is a female bee.



Yucca plants use moths to carry their pollen. The moth lays its eggs on the flowers. Later, its caterpillars feed on the new seeds.

The enormous flower of the rafflesia plant smells of rotting meat. This attracts flies expecting a tasty meal. Pollen sticks to their bodies when they land on the flower.



## Seeds and fruits

As a seed begins to grow, the flower dies.

Pips, nuts and beans are seeds. The shells, berries and pods they grow inside are fruits.



Pine cones are a type of fruit. As the seeds ripen inside, the cone scales harden and close up. When they open up, the seeds are blown away.

Seeds can be many different shapes and sizes.

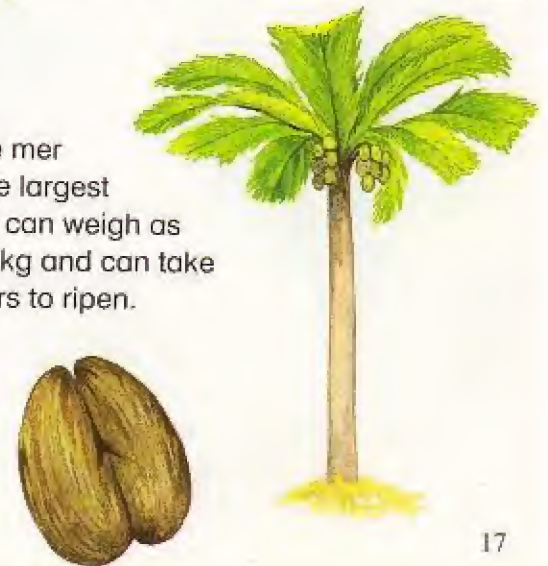


In 1966 frozen Arctic lupin seeds were found in Canada. They were thought to be about 15,000 years old. Despite their age, they sprouted and grew into plants.



The smallest seeds come from orchids.

The coco de mer palm has the largest seeds. They can weigh as much as 20 kg and can take up to 10 years to ripen.

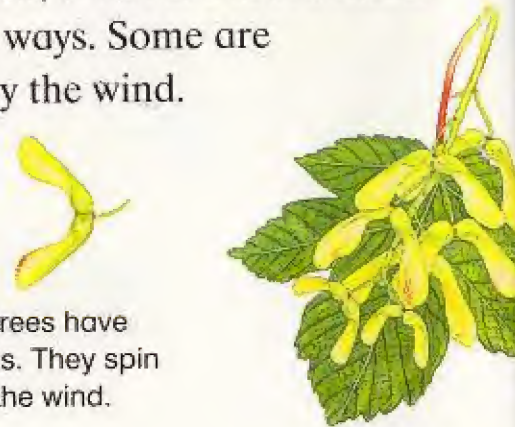




## Travelling seeds

Seeds contain tiny plants which have a store of food. It is important for a plant to scatter its seeds so that the young plants have enough space and water to grow.

Like pollen, seeds are scattered in different ways. Some are carried by the wind.

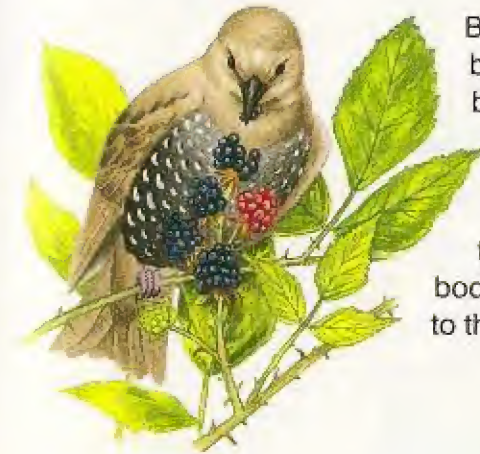


Sycamore trees have winged fruits. They spin along with the wind.



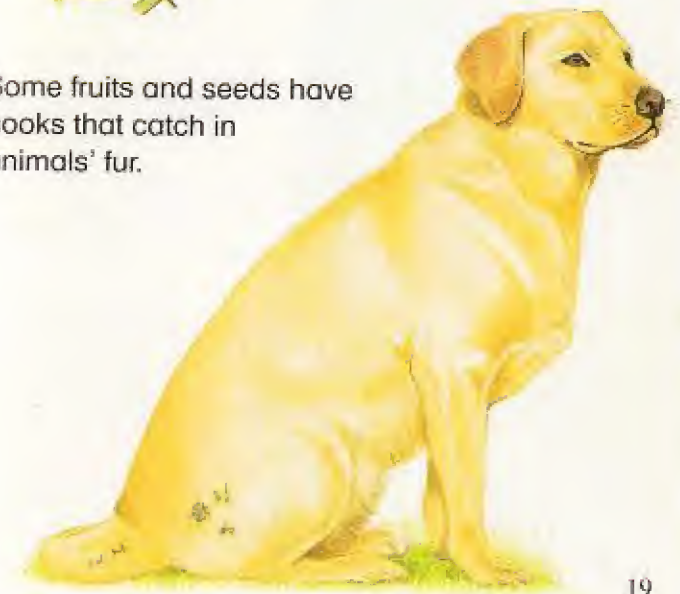
When the flower of a dandelion dies, its flower head becomes a mass of seeds, each with a tiny parachute.

Many fruits and seeds are spread by animals and birds.



Berries may be eaten by birds and insects. The seeds pass through their bodies and fall to the ground.

Some fruits and seeds have hooks that catch in animals' fur.





# Trees

Trees are plants with thick, woody stems called trunks. They have bark to protect them from heat, cold, damp, disease and pests.



A cross section of a tree trunk. Bark is the tough outer layer.

The number of rings across the section of a tree trunk tells you how old a tree is. In mild climates, a new ring grows every year.

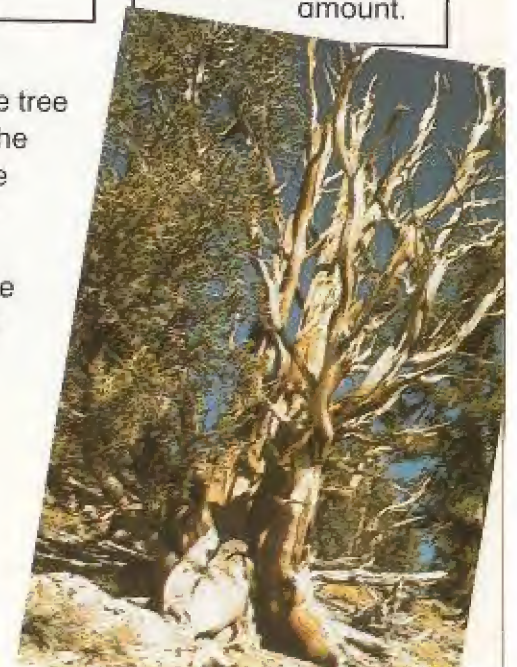


The fastest growing tree is the eucalyptus. It can grow as much as 3 cm in a day.



The Sitka spruce can take as long as 10 years to grow the same amount.

A bristlecone pine tree is thought to be the oldest plant in the world. It is about 4,600 years old. This tree was alive when the ancient Egyptians were building the pyramids.



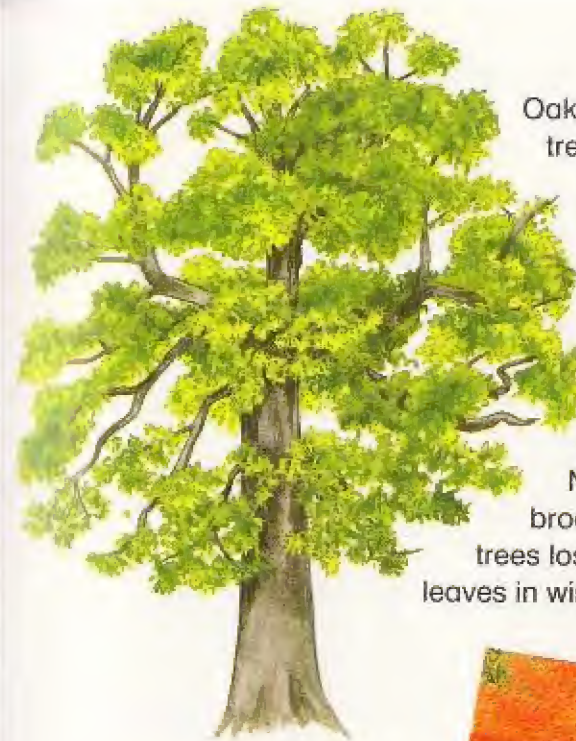


## Types of trees

There are two main types of trees – **conifers** and broad-leaved trees.



Fir and pine trees are conifers. They have sharp, thin leaves, called needles, on sloping branches. They produce their seeds in woody cones. Most conifers are evergreen. This means that they keep their leaves during winter.



Oak and maple trees are broad-leaved. They have wide, flat leaves and a bushy shape. Nearly all broad-leaved trees lose their leaves in winter.

In autumn, the green chlorophyll in the leaves of most broad-leaved trees breaks down and they turn red, brown and yellow. Eventually the leaves die and fall off.

maple trees





## Fungi, algae and lichens

Mushrooms and toadstools are fungi. They do not have proper roots or stems. Because they do not contain chlorophyll, they are not green and can't make their own food. They live off other plants and animals.



The dryad's saddle lives off tree trunks and stumps.



This fly agaric toadstool usually grows on the forest floor.

Algae include tiny pond plants and much larger seaweeds.

Pleurococcus is an alga. It grows on the moist side of tree trunks and looks like a green powder.



A lichen is two plants – a fungus and an alga. The fungus holds the plant in the ground. The green alga makes the food.



One type of lichen, reindeer moss, provides food for Lapland's reindeer.



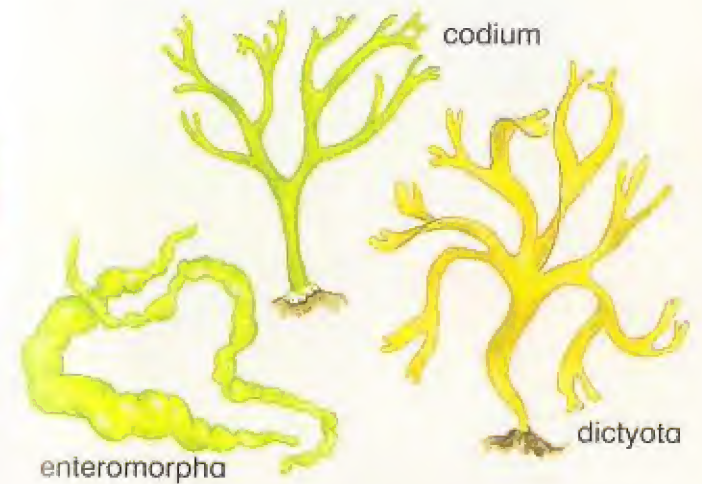
## Water plants

Some plants are able to live in water. Some float on the water and others live under the water.



The giant Amazon water lily has the largest water leaves. Thick ribs underneath the leaf help it to float on the surface of the water. The leaves are strong enough for a child to sit on.

Seaweeds are algae that live in the sea. They provide food and shelter for many sea creatures.



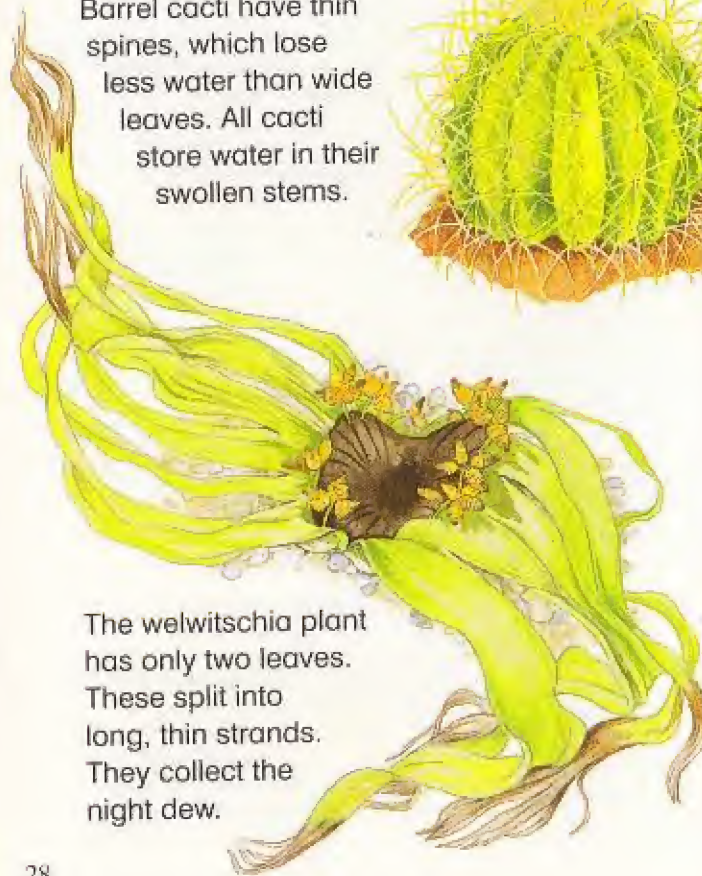
This bladder wrack lives on rocky seashores. It has gas-filled bubbles to help it to float near the surface of the water.



## Desert plants

Some plants can live in hot, dry **deserts** where water is scarce.

Barrel cacti have thin spines, which lose less water than wide leaves. All cacti store water in their swollen stems.



The welwitschia plant has only two leaves. These split into long, thin strands. They collect the night dew.

Other plants have huge underground roots.



The tamarisk tree grows in the Mediterranean, central Asia and northern China. Its huge underground roots grow 50 m into the ground to find water.



## Mountain plants

Mountain plants have to survive fierce winds and biting cold.

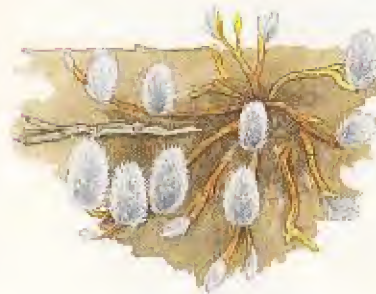


pink



gentian

Pinks and gentians grow very close to the ground in tight clumps. This protects them from cold, drying winds.



Because of the cold, dry winds, some trees only grow 10 cm tall.

Mountain plants grow very slowly because they do not have a lot of energy. Many take over 10 years to flower.

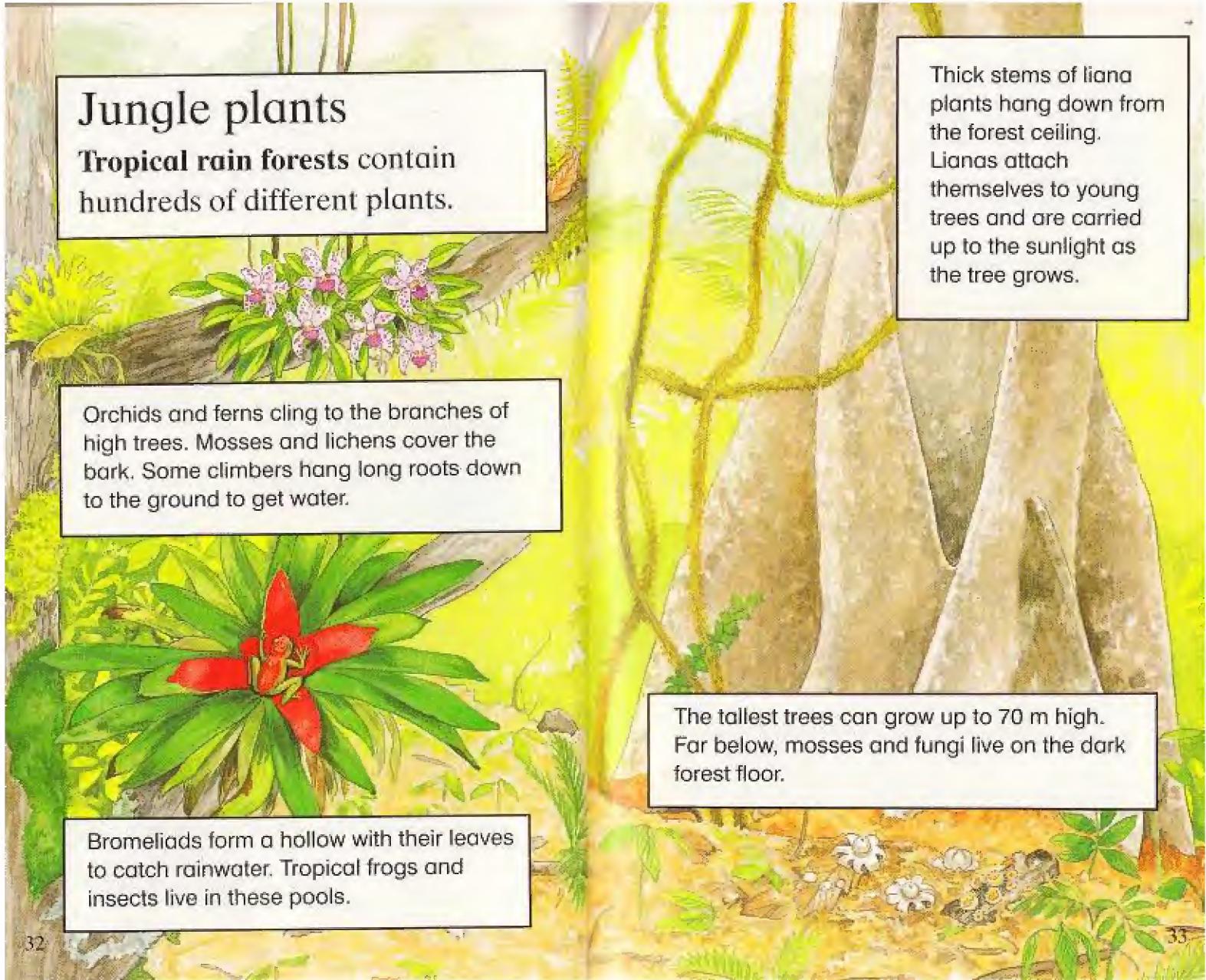


A lichen on a rock may take 100 years to grow to the size of a postage stamp.

Alpine snowbell shoots give off heat to melt a patch of snow so that the plant can flower even when the ground is icy.







## Jungle plants

**Tropical rain forests** contain hundreds of different plants.

Orchids and ferns cling to the branches of high trees. Mosses and lichens cover the bark. Some climbers hang long roots down to the ground to get water.

Thick stems of liana plants hang down from the forest ceiling. Lianas attach themselves to young trees and are carried up to the sunlight as the tree grows.

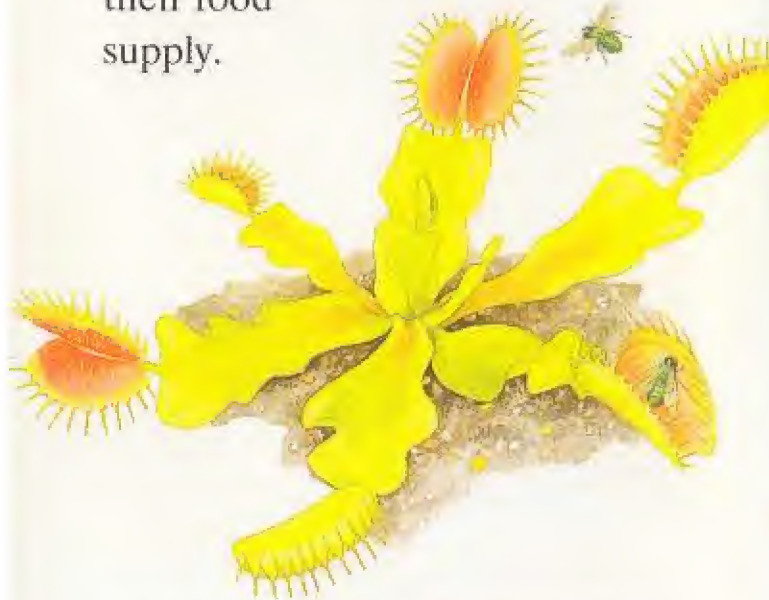
The tallest trees can grow up to 70 m high. Far below, mosses and fungi live on the dark forest floor.

Bromeliads form a hollow with their leaves to catch rainwater. Tropical frogs and insects live in these pools.



## Plants that feed on animals

Some plants need to break down and absorb (**digest**) animals such as insects and frogs to improve their food supply.



The Venus's flytrap attracts insects with its bright leaves. When an insect lands on them the leaves snap shut. They stay closed until the insect is digested.

Pitcher plants have hollow, jug-shaped leaves. They attract insects by smell. The insects slip down the leaves into a pool of liquid. Here, they are absorbed by the plant's juices.



The sundew plant catches insects with its sticky hairs. It

then absorbs the insects' juices through its leaves.

## Useful plants

As well as supplying us with food, plants have many other uses.



Rubber is made from **latex** collected from cuts in the bark of rubber trees.



Cork oak bark is used to make bottle corks and mats.



Cotton is produced from the **boll** of the cotton plant.



String comes from the fibres in the leaves of the sisal plant.

Black olive fruits produce a clear, yellow oil used in soap making and cooking.





## Plant medicine

Plants have been used to treat illnesses for thousands of years.



The ancient Chinese found that ginseng roots were good for their health.

Many modern medicines were first discovered in plants.

Aspirin comes from the bark of the willow tree. ►



Quinine is used to cure **malaria**. It comes from the bark ◀ of the cinchona tree.

Plants are still used today as medicines.

Tea made from camomile flowers helps people to relax. ►



◀ Eating garlic is said to lessen the chance of heart attacks.

castor oil plant



Plant oils are also used. Castor oil is used in ointments. Eucalyptus oil helps to cure coughs and colds.

eucalyptus



## Grasses

Grasses are the largest plant family. There are over 10,000 types. Rice and wheat are the grasses that are most important to people.



Rice and wheat are called staple foods because so many people eat them as a main part of their diet.



Rice grows in Asia. It needs plenty of water, so farmers grow it in flooded fields called **paddy fields**.

About 350 million tonnes of wheat are grown each year. Most of this comes from the USA and Russia. Wheat is ground into flour to make bread.



rice



maize



oats



barley



Rice and wheat, together with maize, oats and barley, are called **cereal crops**.

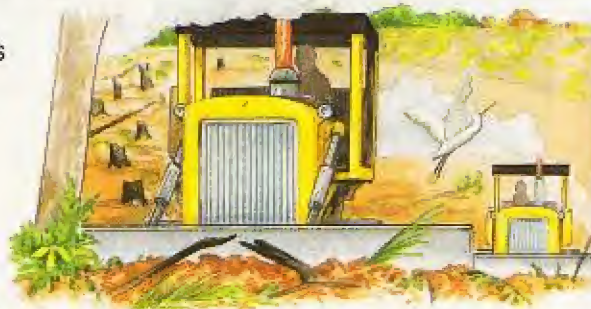


## Plants in danger

Today, about one-tenth of the world's plants are in danger of dying out.

Forests are being cut down for timber and to

make room for building and farming land.



Pollution is killing many sea and river plants.

Hedgerows are destroyed to make way for roads.

Fortunately, groups like the World Wide Fund For Nature are helping to save plants.

Rare plants are grown in botanical gardens and then planted in their natural habitat.



Areas where important and valuable plants grow are being protected and made into **national parks**.

## Glossary

**algae** Simple plants that contain chlorophyll but have no proper stems, roots or leaves.

**boll** The cotton seed pod that bursts open when ripe.

**cereal** The seeds of a cultivated grass that can be used as food.

**chlorophyll** A green chemical that allows plants to make food from light energy.

**conifers** Trees with needle-shaped leaves that produce their seeds in woody cones.

**desert** Regions that have little rainfall.

**digest** To convert food into a form that a plant or animal can use.

**latex** A milky liquid collected when the bark of a rubber tree is cut. It is used in the production of rubber.

**malaria** A disease caused by mosquito bites. It causes fever and chills.

**national parks** Areas where important or rare plants and animals are protected in their natural habitats.

**nectar** A sugary liquid produced by some flowers to attract insects.

**paddy fields** Waterlogged fields where rice is grown.

**photosynthesis** The process by which green plants use the energy of the sun to make food.

**pollen** A fine powder produced by male flowers.

**tropical rain forests** Hot, rainy areas with no seasons and rich plant growth.

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